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10/562,176	12/23/2005	Tetsujiro Kondo	279988US6PCT	1359

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EXAMINER
NEWMAN, MICHAEL A

ART UNIT	PAPER NUMBER
2624	

NOTIFICATION DATE	DELIVERY MODE
10/05/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-5</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-5</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>23 December 2005</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☒ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>4/23/2007; 3/21/2006</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 3, 4 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 1, 3, 4 and 5 recite the limitation "said movement blurring" in lines 15, 15, 16 and 17 respectively. There is insufficient antecedent basis for this limitation in the claim.

5. Claims 1, 3, 4, and 5 recite the limitation "...generating a normal equation using a first equation where in the pixel value of each of the pixels within said processing region is *substituted as to a model* generated by said model generating means..." It is unclear what is meant by the phrase, "substituted as to a model". As recited it can be interpreted as, at least: that the pixel values are being substituted as the model or that the pixel values are substituted into the model. Therefore, the claim is indefinite.

Claim Rejections - 35 USC § 101

6.   35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7.   Claims 4 and 5 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

a.   Regarding claim 4, the claim is non-statutory as it is directed to a computer program *per se*. Any computer program must be stored in a computer readable storage medium to enable the underlying functionality. A structural and functional interrelationship between the computer program and the structural elements o the computer, which would permit its functionality to be realized, should be included in the claim. Applicants are advised, per Technology Center policy, such claims are considered non-statutory subject matter unless they are directed towards "A computer readable medium having computer executable program code..."

b.   Regarding claim 5, the claim is non-statutory. Although it is not directed to a computer program *per se*, as recited, the "recording medium" is not necessarily computer readable (i.e. printed paper) and thus fails to enable the underlying functionality of the program steps. Applicants are advised, per Technology Center policy, such claims are considered non-statutory subject matter unless they are directed towards "A computer *readable* medium having computer executable program code..."

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

9.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating
        obviousness or nonobviousness.

10.   Claims 1, 2, 3, 4 and 5 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Buckler et al. (U.S. Patent No. 5,030,984) in view of Kanbara (U.S.

Patent No. 5,689,737). Hereinafter referred to as Buckler and Kanbara respectively.

     a.   Regarding claims 1, 3, 4 and 5, Buckler teaches a signal processing

device comprising: processing region setting means for setting a processing

region **(Buckler Col. 10 lines 16 – 24)** within image data wherein a light signal of

the real world is projected on a plurality of pixels, each having a time integration

effect **(Buckler Fig. 2 element 16 – Col. 5 lines 11 – 16) [Note that the CCD**

sensor, having pixels, accumulates/integrates outside light at a period of

time corresponding to the time the camera shutter is open], and a portion of

the continuity of the light signal of the real world is lost **(Buckler Col. 6 lines 19 –**

21) **[Note that the gradient, corresponding to image changes, indicates a loss of continuity (due to edges or object features)]**; movement vector setting means for setting movement vectors for an object within said image data corresponding to the continuity of the light signal of the real world, wherein a portion of the continuity of said image data is lost **(Buckler Fig. 1 element 26 – Col. 6 lines 19 – 25 and 42 – 44)**; model generating means for modeling the relation between the pixel value of each of the pixels within said processing region and the pixel value of each of the pixels without said movement blurring occurring, assuming that the pixel value of each of the pixels within said processing region is a value wherein the pixel value of each of the pixels without movement blurring occurring which correspond to said object is integrated while shifting corresponding to said movement vector **(Buckler Col. 6 lines 42 – 44)** **[Note that the relation/displacement in regions with intensity changes is modeled by a single motion vector]**; normal equation generating means for generating a normal equation using a first equation wherein the pixel value of each of the pixels within said processing region is substituted as to a model generated by said model generating means **(Buckler Col. 6 line 63)** **[Note that $f_{x \, and} \, f_y$ are the measured values which are substituted into the equation]**, and a second equation which constrains the relation between each of the pixels without said movement blurring occurring **(Buckler Col. 6 line 29)** **[Note that the constrain on the derivative to be 0 corresponds to pixels without change or motion]**. Buckler further teaches that the calculated motion vectors can be

stored in the memory of the camera and used a later time in a restoration

process **(Buckler Col. 6 lines 10 – 16)**. However, **Buckler fails to teach** and

actual world estimating means for estimating a pixel value of each pixel wherein

said movement blurring is not occurring, by computing said normal equation

which is generated by said normal equation generating means. **Pertaining to**

the same field of endeavor, Kanbara teaches a shake detection system for

a camera in which displaced pixels are realigned to the proper positions

based on detected movement coordinates (Kanbara Col. 3 line 62 to Col. 4

line 5). <u>Therefore, it would have been obvious to one of ordinary skill in the</u>

<u>art at the time the invention was made to use the resulting motion vectors</u>

<u>generated by Buckler to correct the blur due to movement, as suggested by</u>

<u>Buckler, by pixel realignment as taught by Kanbara in order to improve the</u>

<u>image quality by removing effects of blurring, shaking, etc.</u>

-        Regarding claims 4 and 5, Buckler teaches embodying the above-

discussed process in program code to be executed by a computer

(Buckler – "Appendix A" – Cols. 11 to 18).

b.   Regarding claim 2, Buckler as modified by Kanbara with regards to claim

1, further teaches that said normal equation generating means generates a

normal equation using a first equation wherein the pixel value of each of the

pixels within said processing region is substituted as to the model generated by

said model generating means **(Buckler Col. 6 line 63) [Note that f_x and f_y are the**

measured values which are substituted into the equation], and a second

equation wherein the difference of the pixel value of each pixel wherein said

movement blurring is not occurring **(Buckler Col. 6 line 29) [Note that the**

derivative in x and y with respect to time measures the difference of pixel

values (as set by the definition of a derivative), and setting it to 0 requires

that those pixels do no exhibit change or displacement].

Conclusion

11.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

        a.   Borer (U.S. Patent No. 6,381,285) teaches a gradient-based motion

estimation system including the basics of using a *least squares* method to

minimize the sum of the squares of error vectors to provide best fit motion

vectors based on a constraint equation providing moving objects do no change in

time.

        b.   Horiuchi (U.S. Patent No. 6,801,248) teaches an image capture system

including pixel interpolation correction based on motional vectors. The motional

vectors are generated by tracking edges.

        c.   Eiberger et al. (U.S. Patent No. 5,943,090) teaches a system to correct

film scanning steadiness by detecting edges to calculated motion vectors.

        d.   Araki et al. (U.S. Patent No. 5,881,170) teaches a similar motion

detecting method based on detected object contours.

e.   Tokumitsu et al. (U.S. Patent No. 5,729,290) teaches controlling a

camera's auto-focus mechanism by first removing motion-caused blurring. This

is achieved by generating motion vectors by tracking the width change (or

smudging) of detected edges.

f.   Kondo et al. (EP 1,061,473) teaches the pixel prediction method by

applying prediction coefficients to measured data.

g.   Sirat (U.S. Patent No. 5,892,602) teaches the well known-fact that modern

CCD cameras, having a plurality of light-detecting pixel-elements, by design
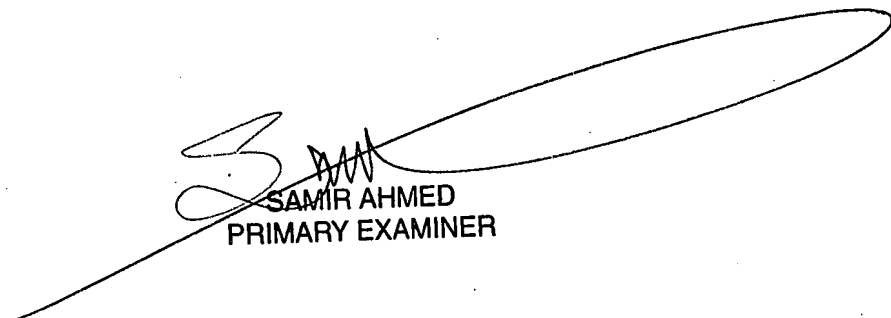
result in spatial-temporal integration.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Michael A. Newman whose telephone number is (571)

270-3016. The examiner can normally be reached on Mon - Thurs from 9:30am to

6:30pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Samir A. Ahmed can be reached on (571)272-7413. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

M.A.N.

SAMIR AHMED
PRIMARY EXAMINER